

**ELECTRICITY ACT 1989 (SECTION 36 AND SCHEDULE 8)  
TOWN AND COUNTRY PLANNING ACT 1990 (SECTION 90)  
THE ELECTRICITY GENERATING STATIONS AND OVERHEAD LINES  
(INQUIRIES PROCEDURE) (ENGLAND AND WALES) RULES 2007**

**PUBLIC INQUIRY TO CONSIDER SECTION 36 ELECTRICITY ACT 1989  
APPLICATION BY STEADINGS WIND FARM LIMITED FOR CONSENT AND  
DEEMED PLANNING PERMISSION TO CONSTRUCT AND OPERATE A WIND  
FARM AT KIRKWHELPINGTON, NORTHUMBERLAND (KNOWN AS  
STEADINGS)**

**PROOF OF EVIDENCE OF  
MALCOLM SPAVEN, M.A., M.Sc  
ON BEHALF OF STEADINGS WIND FARM LIMITED  
AVIATION**

**BERR REFERENCE: GDBC/001/00278C**

**TYNEDALE COUNCIL REFERENCE: 20060540**

**NORTHUMBERLAND COUNCIL REFERENCE: 06/00023/CPC**

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## 1. Qualifications and experience

- 1.1 My name is Malcolm Spaven. I hold an M.A. (Honours) degree from the University of Edinburgh and an M.Sc in Rural and Regional Resources Planning from the University of Aberdeen. I am the principal of Spaven Consulting. Spaven Consulting specialises in analysing and managing the impact of aviation on the environment and the impact of planning developments on aviation, with particular emphasis on the impact of wind energy developments on aviation.
- 1.2 Since 1996, I have undertaken work on the impact of wind farms on aviation interests. I have carried out aviation impact assessments for a range of wind power development companies including:
- ▶ Shell
  - ▶ Scottish Power
  - ▶ United Utilities
  - ▶ Npower Renewables
  - ▶ London Power Company
  - ▶ Natural Power
  - ▶ E.ON UK
  - ▶ Airtricity
  - ▶ West Coast Energy
  - ▶ I & H Brown
  - ▶ Scottish & Southern Energy
  - ▶ Force 9 Energy
  - ▶ Talisman Energy
  - ▶ KE Project
  - ▶ Eurus Energy
  - ▶ Ormonde Wind Energy
- 1.3 I have also carried out research and analysis of aviation/wind energy issues for other bodies including Prestwick Airport, Norwich Airport, the British Wind Energy Association, the Sustainable Development

Commission, Garrad Hassan, Enviros, BMT Cordah and Environmental Resources Management. I have given evidence in support of planning applications and appeals in respect of wind farm developments at Blinkbonny Height (1996), Little Cheyne Court (2004), Knabs Ridge (2005), Elsham (2006), Rockery Farm Bourn (2006), Tween Bridge (2007) and Bradwell (2007).

- 1.4 I am a qualified pilot with a commercial pilot's licence, an instructor's rating, a night rating and an instrument meteorological conditions rating. In addition to my aviation consultancy I work as a flying instructor at Edinburgh and Fife Airports. I hold a Flight Radio Telephony Operator's Licence and an Air-to-Ground Radio Operator Certificate of Competence. I also carry out auditing of instrument approach procedure charts for airports in the UK, France and Ireland on behalf of gCAP Ltd.

## **2. Scope of evidence**

- 2.1 My evidence complements that of my colleagues Mr James, who deals with the technical aspects of potential impacts of wind turbines on radar, and Mr Trott, who deals with air traffic control aspects. My evidence serves to set out my own view and draw together the conclusions of Messrs Trott and James with my own into an overall conclusion.
- 2.2 This proof draws on material in the draft Aviation Report, written jointly by me (as lead author) with Mr James and Mr Trott, and in the proofs of evidence of Mr James and Mr Trott. A copy of the draft Aviation Report is appended to my proof. It remains in draft since, at the time of writing, various pieces of information which have been sought either remain outstanding or have been provided too late to be included yet. I necessarily reserve the right to add to or amend my evidence in the light of such further evidence as is forthcoming.
- 2.3 I do not seek to repeat or reference all of the draft Aviation Report in my evidence. It should, however, be taken as forming an integral part of my evidence. The conclusions I express below flow from the material in that draft Aviation Report.

## **3. Effects of wind turbines on aviation**

- 3.1 The range of potential effects of wind turbines on aviation is set out in section 2 of the Aviation Report. The only effect of relevance to the Steadings proposal is that concerning primary radar.

#### **4. Consultation history**

- 4.1 A record of the consultations which Steadings Wind Farm Ltd has undertaken with aviation interests is set out in section 3 of the Aviation Report. All potentially affected aviation interests have been consulted and discussions have been ongoing with all aviation objectors.

#### **5. Potential impact on Newcastle International Airport (NIA)**

- 5.1 Analysis of the potential for the Steadings development to affect NIA is contained in section 4 of the aviation report.
- 5.2 The Steadings wind farm is likely to generate some returns on the Newcastle Airport radar display. This does not in itself mean that the Steadings wind farm would cause unacceptable impacts on NIA.
- 5.3 The Steadings wind farm is located in uncontrolled airspace. The bulk of the air traffic in this area is military aircraft flying at low level and light training and recreational aircraft.
- 5.4 A very small proportion of regular commercial flights to and from Newcastle Airport potentially use this airspace.
- 5.5 Steadings is not in an operationally significant area for Newcastle Airport, as defined by the Government Office for the North East study in 2005.
- 5.6 Any impact of the wind farm is likely to be limited by the fact that the majority of commercial flights through the surrounding airspace take place at times when little or no other aviation activity is taking place in the area.

- 5.7 Aircraft receiving a Radar Advisory Service in the vicinity of Steadings wind farm could either be vectored around the turbines, have a limited service applied temporarily, or change to a Radar Information Service.
- 5.8 Closer liaison arrangements between Newcastle and Spadeadam air traffic control could reduce any proportion of air traffic in the wind farm area which is unknown to controllers.
- 5.9 Controllers could be alerted to the need for closer attention to the radar display in the vicinity of Steadings by delineating the wind farm on the radar video map.
- 5.10 Mandatory carriage of Mode S transponders progressively from 2008 will substantially reduce the problem of primary-only radar returns such as those generated by wind turbines.
- 5.11 A Transponder Mandatory Zone in the area around the wind farm would significantly reduce any effects which the wind farm might have on provision of air traffic radar services by Newcastle Airport.
- 5.12 Whilst not required here, data from the existing Lowther Hill radar could be used to provide coverage of the airspace above Steadings without displaying radar returns from the wind turbines.
- 5.13 The foregoing conclusions apply both to Steadings alone and cumulatively.
- 5.14 The Steadings proposal would not have an unacceptable impact on the operation of Newcastle International Airport.

## **6. Potential impact on NERL Great Dun Fell radar**

- 6.1 Analysis of the potential for the Steadings development to affect air traffic services provided using the NERL Great Dun Fell radar is contained in section 5 of the aviation report.
- 6.2 The Steadings wind farm is likely to be visible on the NATS En Route radar at Great Dun Fell. This does not in itself mean that the Steadings wind farm would cause unacceptable impacts on the Great Dun Fell radar.
- 6.3 Controllers using the Great Dun Fell radar will not normally be required to route their traffic around radar returns generated by the Steadings wind farm.
- 6.4 The Steadings wind farm is not large enough to pose a risk of an aircraft's radar identity being lost as it crosses through the wind farm radar clutter.
- 6.5 All aircraft in controlled airspace above Steadings will be displaying an SSR label which will assist in maintaining identity through any wind turbine clutter. CAA guidance states that it may be acceptable to use SSR only to maintain the radar identity of aircraft passing through wind turbine clutter.
- 6.6 Military aircraft receiving a service outside controlled airspace in the Steadings area using the Great Dun Fell radar will mostly be receiving a RIS. These aircraft will not require vectoring around the wind farm. Aircraft receiving a RAS may be vectored around the wind farm and/or have their radar service temporarily limited.
- 6.7 In relation to the cumulative impact of consenting all three proposed wind farms in the Steadings area, gaps between and within the three

wind farms make it unlikely that the increased number and area of turbines would lead to loss of radar identity.

- 6.8 Mandatory carriage of Mode S transponders from 2008 will further reduce the problem of primary-only radar returns such as those generated by wind turbines. There is additionally the option of a local Transponder Mandatory Zone.
- 6.9 Whilst not required here, the provision of an additional or composite radar picture using other radar sources has been used to address problems caused by wind farm clutter on radar. The Lowther Hill radar could be used to provide coverage of the airspace above Steadings.
- 6.10 The new Raytheon radar to be installed at Great Dun Fell may offer improved processing techniques against wind turbines.
- 6.11 A BERR-funded study has identified additional techniques which could be employed in the new NATS Raytheon radars to eliminate or mitigate the effects of wind turbines.
- 6.12 Again, the foregoing conclusions apply to Steadings both on its own and cumulatively.
- 6.13 The Steadings proposal would not have an unacceptable impact on operations using the NERL Great Dun Fell radar.

## **7. Potential impact on operations at Spadeadam Electronic Warfare Training Range (SEWTR)**

- 7.1 Analysis of the potential for the Steadings development to affect operations at the SEWTR is contained in section 6 of the aviation report.
- 7.2 The Steadings wind farm is likely to generate unwanted returns on the Berry Hill and Deadwater Fell radar displays at RAF Spadeadam. This does not in itself mean that the Steadings wind farm would cause unacceptable impacts on the operation of the SEWTR.
- 7.3 The Steadings wind farm is not located in a Tactical Training Area and the MoD has accepted that any impact on low flying military aircraft is operationally acceptable.
- 7.4 Low flying aircraft inbound to Spadeadam at low level through the Steadings area may not be visible on radar, irrespective of the presence or absence of wind turbines. Aircraft inbound to Spadeadam at medium level are likely to have been identified and given a radar service before reaching any clutter generated by the Steadings turbines.
- 7.5 Aircraft inbound to the Spadeadam range and in receipt of a radar service are likely to be receiving a RIS and therefore will not require re-routing around any wind farm clutter.
- 7.6 SSR labels on most aircraft will allow controllers to retain radar identity of aircraft passing through the wind farm clutter.
- 7.7 The Steadings wind farm is likely to be visible on the NATS En Route radar at Great Dun Fell.

- 7.8 Spadeadam Controllers using the Great Dun Fell radar will not normally be required to route their traffic around radar returns generated by the Steadings wind farm.
- 7.9 Radar identity of Spadeadam range traffic at high level in controlled airspace is likely to be lost due to high energy manoeuvring irrespective of the presence of wind farms. Maintenance of radar identity of these aircraft will not be required since they are expected to be operating in segregated airspace blocks.
- 7.10 Military aircraft receiving a service outside controlled airspace in the Steadings area using the Great Dun Fell radar will mostly be receiving a RIS. These aircraft will not require vectoring around the wind farm. Aircraft receiving a RAS may be vectored around the wind farm and/or have their radar service temporarily limited.
- 7.11 So far as concerns any cumulative effect of consenting all three proposed wind farms in the Steadings area, gaps between and within the three wind farms make it unlikely that the additional turbines will lead to loss of radar identity.
- 7.12 Services to military aircraft in uncontrolled airspace in the Steadings area could be provided using the Lowther Hill radar, which does not have line of sight to the three proposed wind farms.
- 7.13 Mandatory carriage of Mode S transponders from 2008 will further reduce the problem of primary-only radar returns such as those generated by wind turbines.
- 7.14 Whilst not required here, the provision of a composite radar picture using other radar sources has been used to address problems caused by wind farm clutter on radar. The Lowther Hill radar could be used to provide coverage of the airspace above Steadings.

- 7.15 The new Raytheon radar to be installed at Great Dun Fell may offer improved processing techniques against wind turbines.
- 7.16 A DTI-funded study has identified additional techniques which could be employed in the new NATS Raytheon radars to eliminate or mitigate the effects of wind turbines.
- 7.17 The RAF has extensive experience of providing air traffic radar services in the presence of wind turbines visible on radar displays.
- 7.18 Again, the foregoing conclusions apply to Steadings both on its own and cumulatively.
- 7.19 The Steadings proposal would not have an unacceptable impact on the operation of the Spadeadam Electronic Warfare Training Range.

## **8. Aviation lighting**

- 8.1 There is no requirement for aviation lighting on the Steadings turbines.

## 9. Conclusions

9.1 I conclude from all the available evidence that

- ▶ the only potential effect on aviation from the Steadings turbines which may occur is that on primary radar;
  - ▶ while the Steadings turbines may generate effects on the Newcastle, Spadeadam and Great Dun Fell radars, tried and tested operational measures are available which ensure that any such effects remain at an acceptable level;
  - ▶ although technical measures are not required, there is a range of such measures available which could be applied if deemed necessary to satisfy any remaining concerns from aviation objectors;
  - ▶ any residual, substantive concern can be dealt with here by an appropriately worded condition.
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This concludes my evidence and finally, I confirm the following:

- ▶ I understand my duty to the Inquiry and have complied, and will continue to comply, with that duty.
  
- ▶ I confirm that this evidence identifies all facts which I regard as being relevant to the opinion which I have expressed, and that the Inquiry's attention has been drawn to any matter which would affect the validity of that opinion.
  
- ▶ I believe the facts stated within this proof are true and that the opinions expressed are correct.

Signed..... Dated.....